

Claims

- [c1] A method for manufacturing a light guide plate, comprising:
- providing a mold;
 - melting resin material and mixing an inert gas into the molten resin material;
 - injecting mixture of the molten resin material and the inert gas into a cavity of the mold ;
 - cooling the mold under a constant pressure; and
 - demolding and taking the light guide plate out from the mold.
- [c2] The method for manufacturing a light guide plate as recited in claim 1, wherein the inert gas is argon (Ar), helium (He), or neon (Ne).
- [c3] The method for manufacturing a light guide plate as recited in claim 1, further comprising the step of heating the inert gas before mixing it into the molten resin material.
- [c4] The method for manufacturing a light guide plate as recited in claim 3, wherein the inert gas is heated to a temperature in the range from 100~120°C.

- [c5] The method for manufacturing a light guide plate as recited in claim 4, wherein the inert gas is heated to a temperature of 110°C.
- [c6] The method for manufacturing a light guide plate as recited in claim 1, wherein when the mixture of the molten resin material and the inert gas is injected into the cavity, a viscosity of the molten resin material is in the range from 50~5000 Pa.sec.
- [c7] The method for manufacturing a light guide plate as recited in claim 6, wherein said viscosity of the molten resin is in the range from 200~1000 Pa.sec.
- [c8] The method for manufacturing a light guide plate as recited in claim 1 wherein the mold is made of a metal having a high coefficient of heat transfer.
- [c9] The method for manufacturing a light guide plate as recited in claim 8, wherein the mold is made of copper, a copper alloy, or beryllium copper.
- [c10] The method for manufacturing a light guide plate as recited in claim 1, wherein the mold is made of nickel, a nickel-cobalt alloy, silicon carbide, chrome, or titanium carbide.
- [c11] The method for manufacturing a light guide plate as re-

cited in claim 1, wherein the resin material is methacrylate resin.

[c12] The method for manufacturing a light guide plate as recited in claim 11, wherein a melting temperature of the molten methacrylate resin is in the range from 170~300°C.

[c13] The method for manufacturing a light guide plate as recited in claim 12, wherein said temperature is in the range from 230~260°C.

[c14] A method of making an optical element via injection molding, comprising steps of:
injecting melted resin material mixed up with at least one inert gas into a mold;
cooling the mold; and
obtaining a molded optical element essentially made of resin with at least one inert gas involved therewith,
wherein said molded optical element has a smaller density than those made of resin via injection molding without any inert gas involved therewith.

[c15] The method as described in claim 14, wherein a viscosity of said melted resin material is reduced via said at least one inert gas during molding.